

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
27 January 2005 (27.01.2005)

PCT

(10) International Publication Number  
**WO 2005/007929 A2**

(51) International Patent Classification<sup>7</sup>: **C23C 18/00**

(21) International Application Number:  
PCT/JP2004/010976

(22) International Filing Date: 22 July 2004 (22.07.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
2003-278538 23 July 2003 (23.07.2003) JP

(71) Applicant (for all designated States except US): **TOYOTA JIDOSHA KABUSHIKI KAISHA** [JP/JP]; 1, Toyota-cho, Toyota-shi, Aichi 4718571 (JP).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **HIRAOKA, Motoki** [JP/JP]; c/o TOYOTA JIDOSHA KABUSHIKI KAISHA, 1, Toyota-cho, Toyota-shi, Aichi 4718571 (JP). **YOSHINAGA, Fumitaka** [JP/JP]; c/o TOYOTA JIDOSHA

**KABUSHIKI KAISHA**, 1, Toyota-cho, Toyota-shi, Aichi 4718571 (JP). **DAIZA, Setsuto** [JP/JP]; c/o TOYOTA JIDOSHA KABUSHIKI KAISHA, 1, Toyota-cho, Toyota-shi, Aichi 4718571 (JP). **BESSHO, Takeshi** [JP/JP]; c/o TOYOTA JIDOSHA KABUSHIKI KAISHA, 1, Toyota-cho, Toyota-shi, Aichi 4718571 (JP).

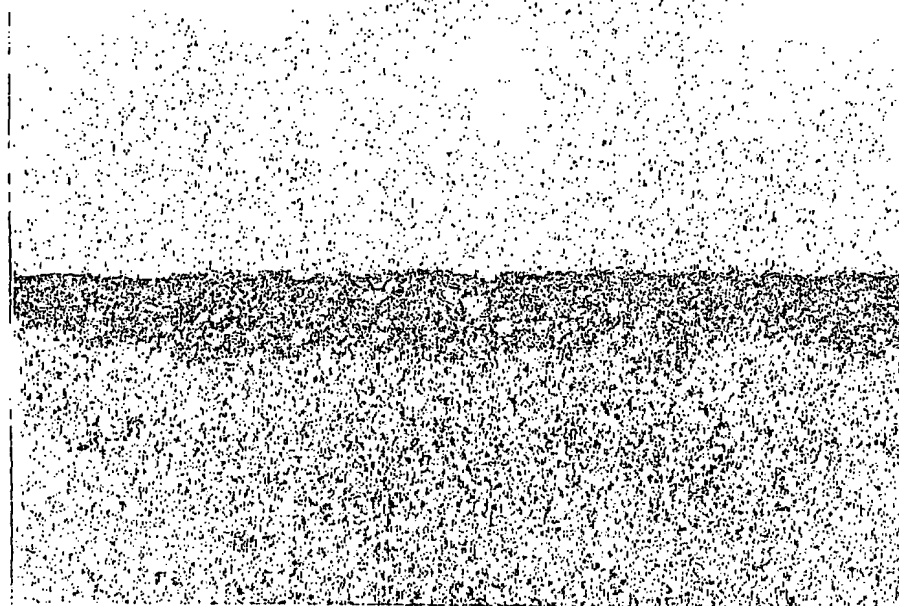
(74) Agent: **OHKAWA, Hiroshi**; 2-5, Meicki 3-chome, Nakamura-ku, Nagoya-shi, Aichi 4500002 (JP).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,

[Continued on next page]

(54) Title: RESIN SUBSTRATE HAVING A RESIN-METAL COMPOSITE LAYER AND METHOD FOR MANUFACTURING THEREOF



(57) Abstract: A resin-metal composite layer is formed by modifying a surface of a resin substrate to a modified layer, contacting the modified layer with a metal compound solution, and adsorbing at least either metal colloids or ions are adsorbed to the polar group, so that metal particles are dispersed into the modified layer. Because of the fineness of the metal particles in the resin-metal composite layer, high transparent can be achieved. The resin-metal composite layer functions as a transparent conductive layer and the like.

WO 2005/007929 A2



(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
27 January 2005 (27.01.2005)

PCT

(10) International Publication Number  
**WO 2005/007929 A3**

(51) International Patent Classification<sup>7</sup>: **C23C 18/31**,  
18/28

(21) International Application Number:  
PCT/JP2004/010976

(22) International Filing Date: 22 July 2004 (22.07.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
2003-278538 23 July 2003 (23.07.2003) JP

(71) Applicant (for all designated States except US): **TOYOTA JIDOSHA KABUSHIKI KAISHA** [JP/JP]; 1, Toyota-cho, Toyota-shi, Aichi 4718571 (JP).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **HIRAOKA, Motoki** [JP/JP]; c/o TOYOTA JIDOSHA KABUSHIKI KAISHA, 1, Toyota-cho, Toyota-shi, Aichi 4718571 (JP). **YOSHINAGA, Fumitaka** [JP/JP]; c/o TOYOTA JIDOSHA

**KABUSHIKI KAISHA**, 1, Toyota-cho, Toyota-shi, Aichi 4718571 (JP). **DAIZA, Setsuto** [JP/JP]; c/o TOYOTA JIDOSHA KABUSHIKI KAISHA, 1, Toyota-cho, Toyota-shi, Aichi 4718571 (JP). **BESSHO, Takeshi** [JP/JP]; c/o TOYOTA JIDOSHA KABUSHIKI KAISHA, 1, Toyota-cho, Toyota-shi, Aichi 4718571 (JP).

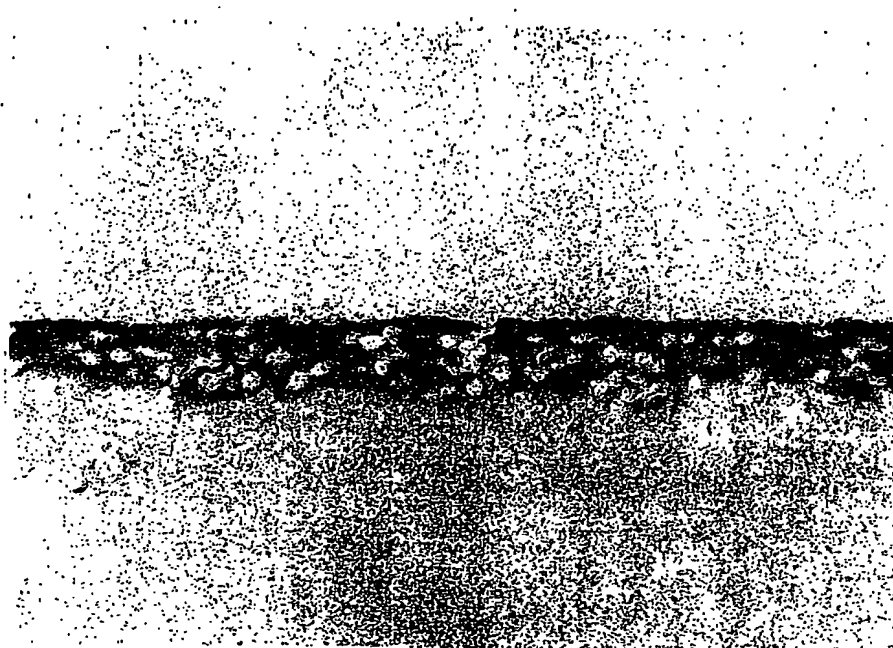
(74) Agent: **OHKAWA, Hiroshi**; 2-5, Meicki 3-chome, Nakamura-ku, Nagoya-shi, Aichi 4500002 (JP).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,

[Continued on next page]

(54) Title: RESIN SUBSTRATE HAVING A RESIN-METAL COMPOSITE LAYER AND METHOD FOR MANUFACTURING THEREOF



(57) Abstract: A resin-metal composite layer is formed by modifying a surface of a resin substrate to a modified layer, contacting the modified layer with a metal compound solution, and adsorbing at least either metal colloids or ions are adsorbed to the polar group, so that metal particles are dispersed into the modified layer. Because of the fineness of the metal particles in the resin-metal composite layer, high transparent can be achieved. The resin-metal composite layer functions as a transparent conductive layer and the like.

BEST AVAILABLE COPY

**(88) Date of publication of the international search report:**  
6 May 2005

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments